



ABDOMINAL SURGICAL SITE INFECTION OCCURRENCE AND RISK FACTORS

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ABSTRACT **Introduction:** Surgical site infections (SSI) remain a significant problem following an operation and the third most frequently reported nosocomial infections.

Objective: The current study was undertaken to identify occurrence of SSI and risk factors associated with it, and the common organisms isolated and its antibiotic sensitivity and resistance.

Material and Methods: The prospective study was carried out on 100 surgeries. Infected samples from patients were collected by following all aseptic precautions and were processed without delay by the standard microbiological techniques.

Results and Conclusions: The overall infection rate was 14%. The SSI rate was 0% in clean surgeries, 6.0% in clean contaminated ones, 23.80% in contaminated ones and 40% in dirty surgeries. Male patients are affected more (18.2%) than the female patients (5.9%). The SSI rate increased with increasing age and it also increased significantly with increasing duration of preoperative hospitalization. The SSI rate was significantly higher in emergency surgeries as compared to elective surgeries. The infection rate was significantly higher as the duration of surgery increased. The most commonly isolated organism from surgical site infections was pseudomonas (42.85%), followed by klebsiella spp (28.5%) and other bacteria. Most of the organisms which were isolated were multidrug resistant. The high rate of resistance to many antibiotics underscored the need for a policy that could promote a more rational use of antibiotics.

KEYWORDS : Abdominal surgical site infections, surgical site infections, pseudomonas, risk factors for SSI.

INTRODUCTION:

Our skin is peppered with land mines, little bacterial bombs just lying in wait for the right moment to explode into action. As long as we are healthy it is thwarted; a person who is ill, however, may a compromised immune system incapable of raising a defence. A surgical incision may be all the provocation the bacteria need for the battle to begin. Surgical infections are those that occur as a result of a surgical procedure or those that require surgical intervention as part of their treatment. They are characterized by breach of mechanical/anatomic defense mechanisms (barriers) and are associated with greater morbidity, significant mortality, and increased cost of care.

Although treatment of infection has been an integral part of the surgeon's practice since the dawn of time, the body of knowledge that led to the present field of surgical infections disease was derived from the evolution of germ theory and antisepsis. Application of the latter to clinical practice, concurrent with the development of anaesthesia, was pivotal in allowing surgeons to expand their repertoire to encompass complex procedures that previously were associated with extremely high rates of morbidity and mortality due to postoperative infections. However, until recently, the occurrence of infection related to surgical wound was the rule rather than the exception. In fact, the development of modalities to effectively prevent and treat infection has occurred only within the last several decades. Advances in infection, control practices include improved operating room ventilation, sterilization methods, surgical technique, and availability of antimicrobial prophylaxis. Despite these activities, SSIs remain a substantial cause of morbidity and mortality among hospitalized patients. This may be partially explained by the emergence of antimicrobial-resistant pathogens and the increased numbers of surgical patients who are elderly and/or have a wide variety of chronic, debilitating, or immune compromising underlying diseases. There also are increased numbers of prosthetic implant and organ transplant operations performed. Thus, to reduce the risk of SSI, a methodical but realistic approach must be applied with the awareness that the risk is influenced by characteristics of the patient, operation, personnel, and hospital.

SSI can double the length of time a patient stays in hospital and thereby increase the costs of healthcare. The main additional costs are related to re-operation, extra nursing care and interventions, and drug treatment costs. The indirect costs, due to loss of productivity, patient dissatisfaction and litigation, and reduced quality of life, have been studied less extensively.

AIM AND OBJECTIVES:

AIM: This study aimed to determine the risks factors affecting abdominal surgical site infections and their occurrence at KIMS KARAD.

OBJECTIVES:

1. Occurrence of Abdominal surgical site infections at KIMS, Karad.
2. Risk factors associated with the abdominal surgical site infections.
3. Most common organisms encountered and its antibiotic sensitivity and resistance in post operative wound infection.

METHODOLOGY

Ethical Statement: The Study made the standards outlining the declaration of Helsinki and Good Epidemiological practices. This study did not change or modify the laboratory of clinical practices of each centre and differences of practices were kept as they are. The data collection was anonymous and identifiable patient information was not submitted.

Individual researchers were responsible for complying with local ethical standards and hospital registration of study.

Source of data: The material for the present study was obtained from patient's undergone abdominal surgery in Department of General Surgery, KIMS, Karad, from 1st Dec 2018 to 1st June 2019.

Surgical site were considered to be infected according to definition by NINS. The wounds were classified according to the wound contamination class system.

Inclusion criteria: Only those who have undergone abdominal surgeries in KIMS hospital karad will be included.

Exclusion criteria: patients with previous abdominal surgery; wound site previously infected; stitch abscess cases; laproscopic surgery.

Sample size: 100 patients will be included in this study who fulfills the inclusion criteria.

Method of collection of data:

An elaborate study of these cases with regard to date of admission, history, clinical features of wound infection, type of surgery, emergency or elective, preoperative preparation and postoperative management is done till patient is discharged from hospital and then followed up the patient on OPD basis for any signs or wound infection. In history, presenting complaints, duration, associated diseases, coexistent infections at a remote body site, personal history including diet, smoking, and alcoholism were noted.

Preoperative findings which include preoperative bath, skin preparation, type and time of preparation, preoperative abdominal skin culture, nasal swab for culture for commensals, preoperative antibiotic use.

Operative findings which include type of incision, wound contamination, drain used and its type, and duration of operation.

Postoperative findings which included day of wound infection, day of 1st dressing and frequency of change of dressing.

Findings on the day of diagnosis of wound infection were noted which included fever, erythema, discharge, type and colour and the exudates was collected from the depth of the wound using sterile cotton swab and was sent to microbiology department for culture and sensitivity.

OBSERVATIONS AND RESULTS:

Table No 1: Incidence of Abdominal Surgical Site Infection

No of Cases	No of Cases infected	Percentage
100	14	14%

Table No 2: Incidence in Relation to Sex

Sex	No. of cases	Infected	Percentage
Male	66	12	18.20%
Female	34	2	5.90%

Table No 3: Incidence in relation to type of operation

Type	No. of cases	Infected	Percentage
Elective	62	4	6.5%
Emergency	38	10	26.3%
Total	100	14	

Table No 4: Incidence in relation to type of SSI

Type	No. of cases	Incidence	Percentage
Clean	14	0	0
Clean contaminated	50	3	6.0%
Contaminated	21	5	23.80%
Dirty	15	6	40.0%
Total	100	14	

Table No 5: Incidence in relation to Pre op Hospitalization

No. of hours	No. of Cases	Infected	percentage
0 to 24	80	8	10.0%
25 to 48	9	2	22.2%
49 to 72	8	3	37.5%
73 to 96	3	1	33.33%
total	100	14	

Table No 6: Incidence in relation to pre op preparation

Shaving time(hours)	No of cases	Incidence	Percentage
0 to 5	50	5	10.0%
6 to 10	15	2	13.3%
11 to 15	12	2	16.6%
16 to 20	23	5	21.7%
Total	100	14	

Table No 7: Incidence in relation to duration of surgery

Duration of surgery	Total No of cases	Infected cases	Percentage
<1.5 hours	59	3	5.1%
1.5-4 hours	41	11	26.8%
Total	100	14	

Table No 8: Incidence in use of Drain and Mesh

	No of cases	Infected	Percentage
Drain	62	13	21.0%
Mesh	11	0	0

Table No 9: Incidence of organism isolated

Wound Growth	No of cases	Percentage
Coagulase positive staphylococcus	2	14.2
Diphtheroids	1	7.14
E.coli	1	7.14
Klebsiella spp	4	28.57
Pseudomonas aeruginosa	6	42.85

CONCLUSION:

1. Incidence of abdominal surgical site infection at KIMS, Karad is 14%
2. Majority of patients belong to age group of 51-60 years which account for 16%
3. Out of 100 cases 62 were elective and 38 were emergency

surgeries. Elective had an incidence of 6.5% and emergency cases had more incidences of 26.3%

4. Out of 100, 50 patients had BMI in the range of 21-25, whereas infection was more among low and high BMI patients accounting for 7.69% and 31.25% respectively.
5. 16 patients were anemic who had incidence of 31.25% of infection. 16 had diabetes, had 31.25% of infection rate, 37 had obesity had 21.63% of infection rate.
6. 80 cases had less than 24 hours of pre op hospitalization. But infection was among 49 to 72 hours pre op stay in hospital accounting for 37.5%
7. In elective cases most common risk factor was obesity followed by clean contaminated type of SSI
8. In emergency cases most common risk factors was dirty type of SSI followed by obesity.
9. Surgical site infection was more in acute necrotizing pancreatitis followed by sigmoid volvulus and hepatic abscess.
10. The cases were prepared pre operatively by shaving between 21 to 20 hrs; had a infection of 21.7% whereas infection of 10% was present in those who have undergone preparation within 5 hrs.
11. Longer the duration of surgery more was the infection rate.
12. Use of drain increased the incidence of wound infection.
13. Most of the cases had wound infection detected on 5th postoperative day.
14. Pseudomonas was the most common organism isolated in this study.
15. Overall, cefoperazone/sulbacyum(64.2%) and cefepime(57.1%) were the most sensitive antibiotics.
16. Overall tigecycline(57.1%) and piperacillin/tazobactam was the most common resistant antibiotic.

SUMMARY:

- Incidence of abdominal surgical site infection is 14%
- Middle age group is commonly involved.
- Emergency cases has high infection rate.
- Risk factors like anaemia, diabetes mellitus, hypoproteinemia, and obesity are associated with increased wound infection rate.
- Longer the duration of surgery more is the wound infection rate.
- Pseudomonas being the most common organism isolated in the study.

The following methods are recommended for further reducing infection:

- Regular surveillance and feedback of results to surgeons, presumably influencing surgical technique.
- Reducing the pre-operative stay to minimum.
- Minimizing the length of operation.
- Avoiding wound drains. If this is not possible, using closed drainage system and removal of drains as soon as possible.
- Ensuring that the patient is as fit as possible.
- Using a good surgical technique.
- Encouraging efforts in reducing the known risk factors to a bare minimum in elderly patients.
- Proper collection and transport of samples from the surgical site, immediately on suspicion of infection.
- Awaiting antibiotic sensitivity test results for appropriate antibiotic therapy, to avoid emergence of resistant strains.

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